energy, and continue green and lush right through the summer till the last moment in autumn, or winter, when the growth stops altogether. It is very doubtful if such practice is at all wise. Turf that has been over-stimulated is not in good shape to weather the troublesome times of midsummer with its fungous menace or meet the sudden onslaught of winter. Observation tends to show that the time to feed a green is that period when it can, by reason of weather and inherent habit, make the most active and ready use of the nourishment. Fertilizing right through the year is possible, but must be done with extreme care.

The natural hardiness of certain strains and their ability to withstand cold weather, winter kill and summer scald, better than other varieties is very noticeable among the various grasses found on the golf course, whether of native origin or introduced. Immunity from disease is another variable character. Consideration of these factors and selection with them in mind has had a great deal to do with the development of our best turf grasses for the golf course.

QUESTIONS AND ANSWERS

All questions sent to the Green Section will be answered in a letter to the writer as promptly as possible. The more interesting of these questions, with concise answers, will appear in this column each month. If your experience leads you to disagree with any answer given in this column, it is your privilege and duty to write to the Green Section.

While most of the answers are of general application, please bear in mind that each recommendation is intended specifically for the locality designated at the end of the question.

1. Brown-patch fungus affects leaves.—Why is it that, if brown-patch spores live in soil, the brown-patch attack starts at the tips of the grass and not at its roots? (Massachusetts.)

ANSWER.—Your question as to why the disease affects the blades of grass when the fungus lives in the soil is one which is frequently asked. Just why this happens we do not know. It is not an uncommon thing for a fungus to attack the leaves of a plant and not injure the roots. Similar conditions exist in human pathology. The organisms causing some of our skin diseases, for instance, do not affect parts of the body other than the skin.

2. Winter killing: probably snow-mold.—I am sending you under separate cover a sample of fungus. This sample has been taken from a green lying high and dry. Two-thirds of the green is affected and the grass seems to be dead. We had 30 inches of snow in the early part of December, which disappeared on January 6th, and it was then I noticed the fungus. I do not think this can be snow-mold as I saw this fungus in the winter of 1926 and 1927 before the snow came. (British Columbia.)

ANSWER.—From your description we suspect that the injury was due to some fungus, probably of the snow-mold type. The fact that you found the same type of injury even in the absence of snow does not necessarily rule it out of consideration. "Snow-mold" is a common name used to designate one or more of the fungi injuring plants at a very low temperature. The moist conditions provided by a

covering of melting snow apparently are just the conditions needed for the growth of this group of fungi. Therefore, the damage is ordinarily associated with a covering of snow, although the snow itself has nothing to do with the damage except in an indirect way in so far as it affects the growth of the fungi. This association has led to the common name, "snow-mold." However, moisture from light showers or heavy fog during periods when the temperature is just a little over the freezing point may also provide conditions favorable for these fungi. Therefore, it is not an uncommon experience to find injury from the so-called "snow-mold" fungi when there has been no snow whatever on the greens.

3. Injury from ammonium sulfate.—May we ask you to assist us in getting rid of brown-patch in putting greens? Something has been tried; I am under the impression that it was a suspension of calomel. It did not work well. This is the first year that yellow-patch has appeared here, it followed the application of ammonium sulfate, I think in excessive amounts. (Rhode Island.)

ANSWER.—The "brown-patch" of which you write is probably not the diseased condition for which calomel is recommended. Calomel is used to control fungous diseases on grass, but is altogether ineffective against brown-patched areas which are caused by excessive amounts or careless applications of other chemicals. Since the yellowing appeared soon after an application of ammonium sulfate, we assume that the injury you speak of is simply a burn due to uneven or excessive applications of this fertilizer. There is nothing to do in such cases except to keep the turf thoroughly watered and, as a rule, this will soon make it recover.

4. Sulphur for soil improvement.—I am enclosing an article on "Sulphur in Soil Fertilization Problem." You will note that it refers particularly to the fact that a heavy application of sulphur is necessary, in some cases, to bring about a change in the structure of clay particles which allows better water percolation and drainage of alkali salts. Do you feel that sulphur could in any way help our grass problem on the greens and fairways? (Missouri.)

ANSWER.—There are certain soils which are unquestionably benefited by an application of sulphur. This is particularly true of certain crops. As the article points out, sulphur may act as a fertilizer and may also influence the structure of the soil. As is usually the case in such articles, there is no mention made of the limitations to such benefits. There are probably comparatively few soils where sulphur is the limiting factor for plant growth, and certainly your soils are not likely to require a great deal of sulphur. The alkali soils mentioned in the article are those which are found in the Far West and do not apply to the so-called alkaline condition found on golf courses. Our Mid-Western soils are not "alkali" soils, although they may be "less acid" than is desired for putting greens. Sulphur, as you may know, is used as a fungicide against many of our plant diseases. This suggested that it might be used against brown-patch. We soon found, however, that instead of controlling the fungus these applications proved toxic to grass and, therefore, had to be discontinued. For some reason, which we are at present unable to explain, sulphur when used in excess on grass gradually reduces its vigor. For that reason we advise you to avoid using it on your course.

AS WE FIND THEM

Stepping from the eighteenth green with the Green Committee Chairman and the Greenkeeper, it was suggested that we "stick around and hear the angels sing. You will hear their daily chant to the Green Committee and Greenkeeper." So there we waited and watched.

One Mr. Average Golfer soon waddled up to attempt what looked like a "dead sure one." In that terrifying silence, which precedes great storms, he went through all the most approved and prolonged preliminaries of sighting and preparing for that momentous tap. Horror of horrors, he missed! We guessed it; the green was all to blame. The storm broke!

> **"Bill, why in the name of galloping golf balls can't we have some greens on this course? These things would be a disgrace to any cow pasture. There isn't a golfer in the world who could putt on them." Ad Infinitum.**

All this in spite of the fact that the other members of his foursome sank good, long shots and were last seen headed for the locker room with beaming faces not ordinarily associated with "rotten" greens and high scores.

The next group furnished this helpful suggestion: "If you fellows are interested in improving greens, why don't you first find out what the players want? After all, greens are for the golfers and everything should be done to give them exactly what they want."

> **We beat him to that idea by many years. We had long ago been told "when baby cries, give him what he wants." But we had also learned that to obtain results it makes some difference whether baby is "crying for something" or "just crying."**

The greenkeeper suggested that we question a few of the club's best players as to how fast they preferred to have greens. "One of my men is ill and that has interrupted our schedule. Number 16 has not been cut and is very slow today, but this eighteenth is the real 'lightning type.'" The first reply was:

"This green is perfect! Anyone can putt on it. If you could only get all our greens as fast as this one, every player in the city would be clamoring to join this club. Number 16? Is that supposed to be a green? We thought you were planning to let that grow up for hay."

"Fore!" The next foursome is having a terrible time rolling them back and forth across the green. "Bill, what on earth is the matter with this green? If you simply touch the ball, it goes clear across. No use trying to putt on it. Why can't we have all the greens like 'sixteen' is today? You can really hit a ball on that one without making it roll a mile."

> **Now that's settled! All that the green committees, greenkeepers and "those scientific guys" have to do to give the players just what they want (in speed of greens, at least) is to develop some kind of gear-shift. Then if a player "likes 'em fast" he can shift into high, and if he "likes 'em slow" he can shift to low. Bet some of them will want it fixed so they can shift after the ball is struck. Then they'll want a "reverse" so that the one which is "too strong" will roll back at just the right speed—all counting a single stroke.**